

## 3.0 Description of Alternatives

This chapter describes the alternatives to the South Orange County Reliability Enhancement Project (proposed project) under consideration in this Environmental Impact Report (EIR), as well as the process used to screen and develop them. The discussion in Chapter 5, “Comparison of Alternatives,” compares the environmental advantages and disadvantages of the proposed project with those of the alternatives. An Environmentally Superior Alternative is proposed in Chapter 5. Provisions of the California Environmental Quality Act (CEQA) Guidelines (Section 15126.6) that address project alternatives in an EIR state the following:

- The range of alternatives required in an EIR is governed by a “rule of reason.” Therefore, the EIR must evaluate only those alternatives necessary to permit a reasonable choice. The alternatives shall be limited to those that would avoid or substantially lessen any of the significant effects of a proposed project.
- A No Project Alternative shall be evaluated, along with its impacts. The purpose of describing and analyzing a No Project Alternative is to allow decision-makers to compare the effects of approving the proposed project with the effects of not approving the proposed project.
- An EIR does not need to consider an alternative whose effects cannot reasonably be ascertained and whose implementation is remote and speculative.

## 3.1 Alternatives Development and Screening Process

The Alternatives Screening Report (Appendix B) documents the alternatives development and screening analysis conducted to determine the range of alternatives for consideration in this EIR. It documents the criteria used to evaluate and select alternatives for further analysis, including their feasibility, the extent to which they would meet most of the basic objectives of the proposed project, and their potential to avoid or substantially lessen any of the significant effects of the proposed project. The Alternatives Screening Report provides a complete description of each alternative considered during screening, including figures, and discusses why each alternative was either eliminated from further consideration or retained for further consideration in this EIR. The alternatives reviewed included alternative substation sites, alternative transmission line routes, reduced footprint alternatives, and alternatives to constructing new transmission facilities or that would reconductor existing transmission lines. Alternative J, which was identified during the Draft EIR public comment period, was not screened in the Alternatives Screening Report. Information regarding the screening analysis conducted for these alternatives is included in this section.

### 3.1.1 Alternatives Screening Methodology and Criteria

Each potential alternative to the proposed project that was identified by the California Public Utilities Commission (CPUC) for the CEQA review as described in Section 1 were screened using a three-step process:

- Step 1:** Clarify the description of the alternative to allow for comparative evaluation.
- Step 2:** Evaluate the alternative by comparing it with the proposed project and with respect to the CEQA criteria for alternatives.

1       **Step 3:** Determine the suitability of each alternative for full analysis in the EIR based on the results  
2               of Step 2. If the alternative is unsuitable, eliminate it from further consideration.

3  
4 To comply with CEQA requirements for the evaluation of alternatives, each alternative identified was  
5 evaluated according to three criteria (CEQA Guidelines Section 15126.6):  
6

- 7       I. Would the alternative accomplish most of the basic project objectives?  
8       II. Would the alternative be feasible (from an economic, legal, and technological perspective)?  
9       III. Would the alternative avoid or substantially lessen any significant effects of the proposed project  
10           (including consideration of whether the alternative itself could create significant effects  
11           potentially greater than those of the proposed project)?

12 The Alternatives Screening Report (Appendix B) provides more information about the alternatives  
13 screening methodology and criteria.  
14

### 15 **3.1.2 Alternatives to Transmission Facilities**

16  
17 California Public Utilities Code Section 1002.3 requires that the CPUC consider cost-effective  
18 alternatives to transmission facilities when evaluating project applications for a Certificate of Public  
19 Convenience and Necessity. Alternatives A, B1, B2, and B3 (see section 3.2, below) would be cost-  
20 effective alternatives that meet Section 1002.3 requirements because they include methods for meeting  
21 project objectives that would not require new transmission facilities that would operate at voltages equal  
22 to or greater than 200 kilovolts (kV) and would incorporate energy conservation and efficiency  
23 improvement measures. Alternative A would not include the construction of new or upgraded  
24 transmission lines. Alternatives B1, B2, and B3 would reconductor existing 138-kV transmission lines or,  
25 to the extent feasible, make use of transmission lines that are currently not in use.  
26

27 Alternatives A, B1, B2, and B3 include cost-effective demand-side alternatives, e.g., targeted energy  
28 efficiency, demand reduction measures (demand response and load management), and local generation,  
29 that may be implemented within the applicant's 10-year transmission planning horizon. Local generation  
30 refers to small-scale, customer-level distributed generation resources within an electrical service area,  
31 e.g., rooftop solar photovoltaic generation on single-family homes. Alternatives to transmission facilities  
32 may include other types of distributed generation installations (e.g., rooftop solar photovoltaic generation  
33 on commercial facilities, combined heat and power units, and biomass facilities, as well as small wind  
34 and other small-scale, often community-based facilities; CEC 2009) and larger-scale renewable and  
35 conventional generation facilities (e.g., solar fields and natural gas power plants).  
36

### 37 **3.1.3 Alternatives Considered in the Screening Report**

38  
39 Some of the alternatives considered during the screening process were presented in the Proponent's  
40 Environmental Assessment (PEA), and others were suggested by the public during scoping or identified  
41 by the CPUC's Energy Division as a result of the agency's independent review. Each of the alternatives  
42 considered in the Alternatives Screening Report is identified in Table 3-1. The alternatives retained for  
43 further consideration in this EIR are described in Section 3.2. The alternatives eliminated from further  
44 consideration are described in the Alternatives Screening Report (Appendix B).  
45

**Table 3-1 Alternatives Considered in the Screening Report**

Alternative	Identified by	Meets Basic Objectives	Feasible	Would Likely Avoids or Substantially Lessens a Potentially Significant Effect	Retained for Consideration in EIR
A. No Project	CPUC	Yes	Yes	Yes	Yes
B1. Reconductor Laguna Niguel–Talega 138-kV Line	CPUC	Yes	Yes	Yes	Yes
B2. Use of Existing Transmission Lines	CPUC	Yes	Yes	Yes	Yes
B3. Phased Construction of Alternatives B1 and B2	CPUC	Yes	Yes	Yes	Yes
B4. Rebuild South Orange County 138-kV System	SDG&E	Yes	Yes	Yes	Yes
C1. SCE 230-kV Loop In to Capistrano Substation	SDG&E <sup>a</sup>	Yes	Yes	Yes	Yes
C2. SCE 230-kV Loop In to Capistrano Substation Alternative Route	CPUC	Yes	Yes	Yes	Yes
D. SCE 230-kV Loop In to Reduced-Footprint Substation at Landfill	SDG&E <sup>a</sup>	Yes	Yes	Yes	Yes
E. New 230-kV Line Operated at 138 kV	CPUC	Yes	Yes	Yes	Yes
F. 230-kV Rancho Mission Viejo Substation	CPUC	Yes	Yes	Yes	Yes
G. New 138-kV San Luis Rey–San Mateo Line and San Luis Rey Substation Expansion	SDG&E	Yes	Yes	Yes	Yes
J. SCE 230-kV Loop In to Trabuco Substation	Public	Yes	Yes	Yes	Yes

Note:

<sup>a</sup> Alternative presented as described by SDG&E but with CPUC modifications or additional design details.

Key:

CPUC = California Public Utilities Commission

EIR = Environmental Impact Report

kV = kilovolt

SCE = Southern California Edison

SDG&E=San Diego Gas and Electric Company

1  
2  
3  
4  
5  
6  
7

### 3.2 Alternatives Evaluated in this EIR

This section describes the alternatives retained for consideration in this EIR. Each of the following alternatives is potentially feasible and would meet most of the basic objectives of the proposed project as discussed in the Alternatives Screening Report (Appendix B) and below in Section 3.2.1.2.

### 3.2.1 Alternative A – No Project<sup>1</sup>

The No Project Alternative is the circumstance under which the proposed project does not proceed (CEQA Guidelines Section 15126.6(e)(3)(B)). The purpose of describing and analyzing a No Project Alternative is to allow decision-makers to compare the effects of approving versus not approving the proposed project. The components of the No Project Alternative described in this report were defined by the CPUC with input from San Diego Gas & Electric Company (SDG&E, or the applicant). Regardless of whether the proposed project is constructed, it is reasonably foreseeable that the following would occur prior to 2018 (SDG&E 2012; CAISO 2014):

- Talega Substation's STATCOM<sup>2</sup> would be replaced; and
- New dynamic synchronous condensers<sup>3</sup> would be installed as approved by the California Independent System Operator (CAISO) to provide additional reactive power support in the proposed project area (approximately 700 megavolt amperes reactive (MVARs) at 230 kilovolts [kV]) between 2015 and 2017.

For further information about the STATCOM replacement and dynamic synchronous condenser installations, refer to the Alternatives Screening Report (Appendix B).

In addition, if equipment at Capistrano Substation<sup>4</sup> or existing distribution or 138-kV lines within the South Orange County Service Area fail or would be inadequate to serve customer demand, it is anticipated that the applicant would replace the equipment or facilities pursuant to CPUC General Order 131-D and CEQA Guidelines Section 15260 et seq. and 15300 et seq. (statutory and categorical exemptions). For example, the applicant is expected to replace 138-kV transformers and update protection equipment at Capistrano Substation and Trabuco Substation in 2015 (SDG&E 2012). The applicant is able to replace facilities without obtaining a Certificate of Public Convenience and Necessity or Permit to Construct from the CPUC as specified in CPUC General Order 131-D for:

- a. Power line<sup>5</sup> facilities or substations with an in-service date occurring before January 1, 1996, which have been reported to the CPUC in accordance with the CPUC's decision adopting General Order 131-D.

<sup>1</sup> NERC transmission planning standard TPL-001-4 became effective on January 1, 2016. TPL-001-4 restructures the nomenclature for outage contingencies and when and to what degree non-consequential load loss is allowed under single contingency reliability events. The exemption in the pre-2016 NERC transmission planning standard, which allowed for load loss in a radial, local area network during a single contingency was removed in TPL-001-4. However, TPL-001-4 does allow for a maximum load loss of 75 MW during single contingencies (if planned for on a five year horizon). The alternatives affected by this change in allowable load loss under TPL-001-4 is Alternative A (No Project), Alternatives B1 through B4, and Alternatives C1, C2, D, and E. TPL-001-4 is further discussed in Master Response D in the Final EIR.

<sup>2</sup> A STATCOM is a regulating device used to optimize the power transfer capability of alternating current transmission systems. Reactive power (volt-amperes reactive or VARs) is regulated in alternating current transmission systems to maintain required voltage levels. STATCOMs are one option for regulating reactive power. Talega Substation has a STATCOM rated for 100 megavolt-amperes reactive power, which may be referred to as 100 mega VARs or 100 MVARs. It is connected to SDG&E's 138-kV system.

<sup>3</sup> A dynamic synchronous condenser, similar to a STATCOM, is type of device used to optimize the power transfer capability of alternative current transmission systems. Dynamic synchronous condensers are another option for regulating reactive power.

<sup>4</sup> Capistrano Substation was constructed in the 1960s.

<sup>5</sup> As defined by CPUC General Order 131-D, a power line is a line designed to operate between 50 and 200 kV. A distribution line is a line designed to operate under 50 kV.

- b. The replacement of existing power line facilities or supporting structures with equivalent facilities or structures.
- c. The minor relocation of existing power line facilities up to 2,000 feet in length, or the intersetting of additional support structures between existing support structures.
- d. The conversion of existing overhead lines to underground.
- e. The placing of new or additional conductors, insulators, or their accessories on supporting structures already built.
- f. Power lines or substations to be relocated or constructed that have undergone environmental review pursuant to CEQA as part of a larger project and for which the final CEQA document (EIR or Negative Declaration) finds no significant unavoidable environmental impacts caused by the proposed line or substation.
- g. Power line facilities or substations to be located in an existing franchise, road-widening setback easement, or public utility easement; or in a utility corridor designated, precisely mapped and officially adopted pursuant to law by federal, state, or local agencies for which a final Negative Declaration or EIR finds no significant unavoidable environmental impacts.
- h. The construction of projects that are statutorily or categorically exempt pursuant to § 15260 et seq. of the Guidelines adopted to implement the CEQA, 14 Code of California Regulations § 15000 et seq. (CEQA Guidelines).<sup>6</sup>

Additionally, CPUC General Order 131-D states that the construction of electric distribution line facilities, or substations with a high side voltage under 50 kV, or substation modification projects that increase the voltage of an existing substation to the voltage for which the substation has been previously rated within the existing substation boundaries, does not require the issuance of a Certificate of Public Convenience and Necessity or permit from the CPUC, nor discretionary permits or approvals by local governments. However, to ensure safety and compliance with local building standards, the utility must first communicate with, and obtain the input of, local authorities regarding land use matters and obtain any non-discretionary local permits required for the construction and operation of these projects. Hence, it is reasonably foreseeable that substation and power line work allowed by General Order 131-D without CPUC approval could occur under the No Project Alternative.

### **3.2.1.2 No Project Alternative and Objectives of the Proposed Project**

The Alternatives Screening Report states that the No Project Alternative would at least partially meet Objectives 1 and 2 (Appendix B). Given the applicant's ability to replace failed or inadequate equipment at Capistrano Substation to meet conditions that may occur under the No Project Alternative pursuant to General Order 131-D and CEQA (see above), it is clear that the No Project Alternative would meet Objective 2 as defined by the CPUC (Section 1.2.1, "Objectives of the Proposed Project"). General Order 131-D would also allow the applicant to reconductor or otherwise modify existing 138- kV power lines without obtaining a Certificate of Public Convenience and Necessity or Permit to Construct from the CPUC; therefore, it is reasonable to assume that as part of the No Project Alternative, the applicant would modify its existing 138-kV system to the extent allowed by General Order 131-D to avoid power line failures and meet customer demand. The following section describes why the No Project Alternative could fully meet Objective 1.

---

<sup>6</sup> These exemptions do not apply when a significant effect on the environment would occur as defined in CEQA Guidelines Section 15300.2 or CPUC General Order 131-D.

1 **Objective 1: Reduce the Risk of Instances that Could Result in the Loss of Power to**  
2 **Customers through the 10-year Planning Horizon**

3 The applicant’s power flow data indicate that if no work is conducted on the South Orange County 138-  
4 kV System by 2020, a section of the Talega–Laguna Niguel–San Mateo 138-kV Line (TL13835) could  
5 overload should either of the following Category C, N-1-1 scenarios (see Chapter 1, Section 1.1.2,  
6 “Transmission and Electrical Demand Planning”) occur:

- 7
- 8 1. Failure of the Pico–Capistrano 138-kV Line (TL13816) followed by failure of the Pico–Trabuco  
9 138-kV Line (TL13833); or
- 10 2. Failure of the Talega–Pico Line (TL13836) followed by failure of a section of the Talega–Pico–  
11 San Mateo Line (TL13846).
- 12

13 Other Category C (N-1-1) scenarios are also possible by 2020, but these are the two worst-case (highest  
14 potential overload) scenarios described by the applicant. In accordance with CPUC General Order 131-D,  
15 it is anticipated that the applicant would implement system adjustments (e.g., reconductor 138-kV line  
16 segments) prior to this date to ensure that some or all of these overload scenarios do not occur. Examples  
17 of system adjustments that could be implemented may be similar to the installations discussed under  
18 Alternatives B1 through B4. It is also possible that an N-2 (Category B) event could occur by 2020, but it  
19 is not anticipated that the applicant would make system adjustments to address these events, as load  
20 shedding would be allowable.

21

22 In addition, under the No Project Alternative, it is assumed that energy efficiency improvements and  
23 distributed generation facilities (including rooftop solar generation) will continue to be implemented  
24 throughout the 10-year planning horizon that will incrementally reduce load on SDG&E’s 138-kV South  
25 Orange County System. The installation of new rooftop solar generation facilities is expected to continue  
26 during the 10-year planning horizon for the proposed project. Nationwide, the cost of new solar  
27 installations is anticipated to continue to decrease, and the amount of solar power generation is expected  
28 to increase through 2024. Solar energy is the fastest-growing source of renewable generation. Solar  
29 generation is projected to increase by 7.5 percent per year through 2040 nationwide almost exclusively as  
30 a result of increased photovoltaic capacity in both the utility-side and customer-side sectors (USEIA  
31 2014).

32

33 The applicant’s data indicate that by the end of 2014, more than 12.6 megawatts (MW) of demand within  
34 the south Orange County service area will be provided by rooftop solar generation, which is  
35 approximately 3 percent of the approximately 450 MW South Orange County 138-kV System (see  
36 Appendix B). Should the installation of new rooftop solar generation continue to increase within  
37 southern Orange County, the additional generation would substantially offset the increase in electrical  
38 demand anticipated by the applicant, which is estimated at 5.7 MW per year (1.1 percent per year)  
39 through 2024; Table 1-1. In 2013, 3.1 MW of new solar generation was installed within the applicant’s  
40 South Orange County service area (see Appendix B).<sup>7</sup> Additionally, peak demand typically occurs during  
41 daylight hours in the summer, when rooftop solar facilities are capable of generating power. For further

---

<sup>7</sup> The rooftop solar generation capacity data provided by the applicant refer to the nameplate capacity of installed rooftop solar equipment. The applicant is not able to report the specific amount of power provided by Net Energy Metering program participants with rooftop solar installations. Net Energy Metering program generation, however, is accounted for in the South Orange County 138-kV System’s recorded (historical) peak loads (Figure 1-1) and is reflected in the applicant’s system-wide load forecasts, which are based in part, on historical peak loads.

1 discussion of demand-side management, energy conservation programs, and distributed and renewable  
2 generation, refer to the Alternatives Screening Report (Appendix B).

3  
4 Given the anticipated rooftop solar facility installations and the applicant's ability to replace both  
5 distribution line facilities and 138-kV line facilities to meet conditions that may occur under the No  
6 Project Alternative, this alternative would fully meet Objective 1 as defined by the CPUC (Section 1.2.1,  
7 "Objectives of the Proposed Project"). Therefore, Alternative A would meet two of the three basic  
8 objectives of the proposed project.

9  
10 Additionally, the No Project Alternative described in this report is considered an alternative that meets  
11 the CPUC's requirements for consideration of cost-effective alternatives to transmission facilities as  
12 described in Section 3.1.2, "Alternatives to Transmission Facilities."

### 13 14 **3.2.2 Alternative B1 – Reconductor Laguna Niguel–Talega 138-kV Line<sup>1</sup>**

15  
16 Under Alternative B1, which was identified by the CPUC, a segment of the Laguna Niguel–Talega 138-  
17 kV Line (TL13835) would be reconducted with conductor of a comparable size but higher capacity,  
18 such as aluminum conductor steel supported (ACSS) or similar. ACSS has a higher operating  
19 temperature and greater resistance to overload than other types of comparably sized conductor, such as  
20 aluminum conductor steel reinforced (ACSR) (Southwire 2014). The use of ACSS or similar high-  
21 capacity conductor would allow for high power transfer (e.g., 273 megavolt amperes [MVA]) in  
22 comparison to the existing 138-kV line's 136 MVA rating.<sup>8</sup>

23  
24 Under this alternative, a 138-kV segment (approximately 7.8 miles long) from Capistrano Substation to  
25 Talega Substation would be reconducted (Figure 3-1). Reconducting would occur along the same  
26 transmission line route (Segments 1b to 4) as the proposed project (Figures 2-1 and 3-1). In addition, an  
27 approximately 2.5-mile-long segment of transmission line (TL13835) from Laguna Niguel Substation  
28 would be ~~be tied~~ tap into Capistrano Substation (but would not require reconducting) at a location  
29 adjacent to the substation to create a new Laguna Niguel–Capistrano 138-kV Line under this alternative.  
30 Some structures may need to be replaced during reconducting. Equipment at Capistrano Substation  
31 found to be inadequate would also be replaced.

32  
33 This alternative includes the assumption that the CAISO-approved installation of reactive power support  
34 equipment and anticipated increase in rooftop solar installations within South Orange County as  
35 described under Alternative A would take place. Alternative B1 would meet the CPUC's requirements  
36 for consideration of cost-effective alternatives to transmission facilities as described in Section 3.1.2,  
37 "Alternatives to Transmission Facilities."

38  
39 The applicant proposed a reconducting project similar to Alternative B1 to the CAISO in 2010 and  
40 2011 to address a forecast overload of TL13835 due to a potential Category B (N-1) event caused by the  
41 loss of the Talega–Pico 138-kV Line (TL13836). In 2011, the CAISO recommended the reconducting  
42 project be evaluated in the future because the overload identified would be only by 1 percent. The  
43 CAISO also noted that TL13835 might be upgraded as part of the version of the proposed project  
44 presented to the CAISO at that time (CAISO 2010, 2011).

45  
<sup>8</sup> Transmission line TL13835's existing ACSR conductor has a diameter of 336 kcmil. A circular mil (cmil) is a standard unit of measure used for electrical systems that refers to the area of the cross section of conductor. One cmil is equal to the area of a circle with a 1-mil diameter, and 1 kcmil is equal to 1,000 cmils. Large conductor sizes rated for use on electrical transmission lines are generally 0.6 inches to 2 inches in diameter. ACSR 336-kcmil conductor is approximately 0.7 inches in diameter (Grigsby 2001).



	Replace inadequate equipment at substation		Relocate 12-kV distribution line as proposed
	Existing 230-kV substation	<b>CAISO</b>	California Independent System Operator
	Existing 138-kV substation	<b>SDG&amp;E</b>	San Diego Gas & Electric Company
	Existing Talega to Capistrano area transmission lines (SDG&E)	<b>MVAR</b>	Megavolt Ampere Reactive power
	Reconductor or energize unused transmission lines	<b>kV</b>	kilovolt (= 1000 volts)

\* Under Alternative B3, either Alternative B1 or B2 or both (if needed) would be constructed.

Figure 3-1

EE-003279-0000-08TTO.b2.ai 01/30/2015

### 138-kV Reconductoring and Use of Existing Transmission Lines Alternatives B1, B2 and B3\*

South Orange County Reliability Enhancement Project

1 **3.2.3 Alternative B2 – Use of Existing Transmission Lines (Additional Talega–**  
2 **Capistrano 138-kV Line)<sup>1</sup>**  
3

4 Under this alternative, which was identified by the CPUC, an existing 138-kV transmission line currently  
5 operated as a distribution line (12-kV circuit 315) and an unused transmission line would be connected  
6 and energized at 138 kV. The existing 138-kV line extends approximately 3 miles from Capistrano  
7 Substation southeast to the San Juan Hills High School area. The other transmission line, which is  
8 assumed to be an unused 66-kV or 69-kV line, extends from the San Juan Hills High School  
9 approximately 4.8 miles south to Talega Substation. Sections of the transmission line were identified as  
10 unused by the applicant during the CPUC’s October 16, 2012 site visit. At that time, the applicant  
11 indicated that it planned to remove the line at a future date but not as part of the proposed project.  
12

13 For this alternative, the existing 66-kV/69-kV line’s conductor would be replaced with higher-capacity  
14 but comparably sized conductor (e.g., ACSS). Replacement of the existing wood structures may also be  
15 required. Reconductoring, if required, would occur along the same transmission line route (Segments 1b  
16 to 4) as the proposed project (Figures 2-1 and 3-1). The new Talega–Capistrano 138-kV Line would have  
17 a capacity of approximately 270 MVA depending on whether reconductoring is required and the type of  
18 conductor installed. In addition, equipment at Capistrano Substation found to be inadequate as described  
19 in Section 1.4.1 would be replaced.  
20

21 Under this alternative, the operation of 12-kV distribution circuit 315 at 138 kV would necessitate the  
22 additional installation of a new distribution line route, which would be identical to the distribution  
23 component of the proposed project. This alternative also assumes that the CAISO-approved installation  
24 of reactive power support equipment and anticipated increase in rooftop solar installations within South  
25 Orange County as described under Alternative A would take place. Alternative B2 would meet the  
26 CPUC’s requirements for consideration of cost-effective alternatives to transmission facilities as  
27 described in Section 3.1.2.  
28

29 **3.2.4 Alternative B3 – Alternative B3 – Phased Construction of Alternatives B1**  
30 **and B2<sup>1</sup>**  
31

32 Under this alternative, which was identified by the CPUC, the construction of either Alternative B1 or  
33 B2, or the construction of both alternatives, would occur. The construction of both alternatives would  
34 only occur if necessary to address potential overload events that may be forecast by future transmission  
35 planning studies.  
36

37 If, under this alternative, the components described under Alternative B2 were to be constructed first, the  
38 existing 138-kV line (TL13835) could continue operation while these initial components were  
39 constructed. There would be minimal, if any, impact on the South Orange County 138-kV system during  
40 construction, which would likely result in fewer service disruptions than would otherwise occur. If the  
41 components described under Alternative B1 are constructed first (reconductoring of TL13835), the  
42 existing 138-kV transmission line (currently operated at 12 kV) and unused 66-kV/69-kV transmission  
43 line could potentially be operated at 138 kV during reconductoring of TL13835 to ensure that continuous  
44 electrical service is maintained, which could result in fewer disruptions in service.  
45

46 It is unclear at this time whether the 2.5-mile-long segment of TL13835 from Laguna Niguel Substation  
47 would be required to be tied into Capistrano Substation as described under Alternative B1 if this  
48 alternative is constructed. This alternative includes the assumption that the CAISO-approved installation  
49 of reactive power support equipment and anticipated increase in rooftop solar installations within South

1 Orange County as described under Alternative A would take place. Alternative B3 would meet the  
2 CPUC’s requirements for consideration of cost-effective alternatives to transmission facilities as  
3 described in Section 3.1.2.  
4

### 5 **3.2.5 Alternative B4 – Rebuild South Orange County 138-kV System<sup>1</sup>**

6

7 This alternative was identified by the applicant in the PEA and further refined by the applicant in  
8 response to the CPUC’s request for further description of the improvements that SDG&E anticipates  
9 would be required for the South Orange County 138-kV System should the proposed project not be  
10 approved. Under this alternative, all of the existing 138-kV lines that extend between the applicant’s  
11 Trabuco, Capistrano, Laguna Niguel, and Talega substations would be reconducted (approximately 34  
12 miles; Figure 3-2) except and the Capistrano–Laguna Niguel 138-kV Line (TL13837) and a short section  
13 (TL13846C) that extends through the Talega Corridor area to connect the Talega–Pico–San Mateo 138-  
14 kV Line (TL13846) to Talega Substation. This would include reconductoring, the installation of new  
15 structures, the installation of new underground conduit along five 138-kV lines (TL13816, TL13833,  
16 TL13835, TL13836, and TL13846), and the 7.8 miles of reconductoring described under Alternative B1.  
17

18 In addition, new 138-kV facilities at Capistrano Substation would be constructed as described for the  
19 proposed project and would include the installation of three 138/12-kV transformers and space for a  
20 fourth 138/12-kV transformer at the lower yard of the Capistrano Substation site (Figure 2-3). This  
21 substation expansion would likely result in demolition of the former utility structure that fronts the  
22 substation property on Camino Capistrano; however, no 230-kV substation would be constructed at the  
23 site, and the profile of the rebuilt substation would be lower in height than for the proposed project. Two  
24 230/138-kV transformers that the applicant has indicated are outdated would be replaced at Talega  
25 Substation as proposed. The applicant has also indicated that this alternative would include the reactive  
26 power support elements described under the No Project Alternative. It is assumed that the other No  
27 Project Alternative elements would be included under Alternative B4 as well.  
28

### 29 **3.2.6 Alternative C1 – SCE 230-kV Loop-in to Capistrano Substation<sup>1</sup>**

30

31 A version of this alternative was initially identified by the applicant in the PEA. As compared to the PEA  
32 alternative, Alternative C1 includes sufficient design details to ensure that analysis pursuant to CEQA  
33 may be conducted. Under this alternative, San Juan Capistrano Substation would be constructed as  
34 described for the proposed project. A new double-circuit 230-kV transmission line (3 to 4 miles long)  
35 would be constructed. The line would extend from the proposed San Juan Capistrano Substation to a  
36 location in proximity to Prima Deschecha Landfill (PDL) and the San Juan Hills High School area  
37 (Figure 3-3). At this location, the new 230-kV line would loop in (connect) to Southern California  
38 Edison’s (SCE’s) existing Serrano–SONGS 230-kV line. The new 230-kV line and loop-in connection  
39 would be constructed within the same right-of-way (ROW) as the double-circuit 230-kV line that would  
40 be used for the proposed project. A small amount of new ROW may be required, depending on where the  
41 loop-in connection is constructed. Distribution circuit 315 (12 kV) would be relocated as described for  
42 the proposed project.  
43



EE-003279-0000-08TTO.e.ai 01/30/2015

Figure 3-2  
**Rebuild South Orange County 138-kV System**  
**Alternative B4**

South Orange County Reliability Enhancement Project



**Alternative C1**  
(SCE 230-kV Loop-in to Capistrano Substation)



**Alternative C2**  
(SCE 230-kV Loop-in to Capistrano Substation Routing Alternative)



**Alternative D**  
(New 230-kV Substation at Landfill)

**LEGEND**

- |  |  |  |  |  |   |
|--|--|--|--|--|---|
|  | Proposed 230-kV substation upgrade         |  | Loop-in to existing transmission line          |  | New double-circuit 230-kV line  |
|  | Existing 230-kV substation                 |  | Existing 230-kV lines (SCE)                    |  | New double-circuit 230-kV line in new right-of-way                        |
|  | Existing 138-kV substation                 |  | Existing Talega-Capistrano (SDG&E) 138-kV line |  | Energize existing 138-kV line that is currently operated at 12 kV (SDG&E) |
|  | Replace inadequate equipment at substation |  | Relocate 12-kV distribution line as proposed   |  | Reconductor unused 66-kV line   |
|  |  |  |  |  | New 138-kV line in new right-of-way                                       |

- CAISO** California Independent System Operator  
**SDG&E** San Diego Gas & Electric Company  
**SCE** Southern California Edison Company  
**MVAR** Megavolt Ampere Reactive power  
**kV** kilovolt (= 1000 volts)

Figure 3-3 **SDG&E 230-kV Interconnect with SCE Alternatives C1, C2, and D**  
South Orange County Reliability Enhancement Project

1  
2 **3.2.7 Alternative C2 – SCE 230-kV Loop-in to Capistrano Substation Routing**  
3 **Alternative<sup>1</sup>**  
4

5 A version of this alternative was initially identified by the applicant in the PEA. Like the PEA  
6 alternative, Alternative C2 includes design details sufficient to ensure that analysis pursuant to CEQA  
7 may be conducted, and includes details based on comments received during the EIR scoping meeting  
8 held in the city of San Juan Capistrano. Many of the same components described under Alternative C1  
9 would be constructed, but instead of connecting to SCE’s Serrano–SONGS 230-kV line at a location in  
10 proximity to PDL and south of the San Juan Hills High School area, the connection would be made north  
11 of the San Juan Hills High School area (Figure 3-3). The new double-circuit 230-kV line would be  
12 constructed along the same ROW southeast from Capistrano Substation to San Juan Creek Road. At San  
13 Juan Creek Road, new 230-kV line would be constructed in new underground conduit and within new  
14 ROW along San Juan Creek Road for approximately 1 mile northeast to a location near La Pata Avenue  
15 where it would connect to SCE’s existing 230-kV line. It is assumed that distribution circuit 315 (12-kV)  
16 would be relocated as described for the proposed project.  
17

18 **3.2.8 Alternative D – SCE 230-kV Loop In to Reduced-Footprint Substation at**  
19 **Landfill<sup>1</sup>**  
20

21 A version of this alternative was initially identified by the applicant in the PEA. Like the alternative  
22 presented in the PEA, Alternative D includes design details sufficient to ensure that analysis pursuant to  
23 CEQA may be conducted. Under this alternative, a new 230/138/12-kV substation would be constructed  
24 at PDL in proximity to the transmission corridor that crosses the landfill (Figure 3-3). Both SDG&E and  
25 SCE transmission lines are located within this corridor. Power would be provided to the new substation  
26 from SCE’s Serrano–SONGS 230-kV line. A new double-circuit 230-kV line segment (less than 0.25  
27 miles long) would be constructed, possibly within new ROW, which would loop the new substation into  
28 SCE’s 230-kV line.  
29

30 Under this alternative, a new, single-circuit 138-kV line segment (approximately 0.75 miles long) would  
31 be installed that would use the existing 66-kV/69-kV transmission line route described for Alternative  
32 B2. This line segment would extend from the new substation west to the applicant’s transmission ROW  
33 and then extend north along the 66-kV/69-kV line route to the San Juan Hills High School area, where it  
34 would connect to the applicant’s existing underground 138-kV line.  
35

36 Distribution circuit 315 (12 kV) would be relocated as described for the proposed project, which would  
37 allow the existing 138-kV line that extends from the San Juan Hills High School area to Capistrano  
38 Substation to be energized at 138 kV instead of 12 kV. The new 138-kV segment would be used to create  
39 a continuous new 138-kV line between the new substation and Capistrano Substation.  
40

41 One 230/138-kV transformer would be installed at the new substation with space for a spare if the  
42 applicant provides data indicating a spare could be needed. One 138/12-kV transformer would also be  
43 installed. Space for additional 138/12-kV transformers and/or additional distribution-level transformers  
44 would also be included in the substation design if the applicant provides data indicating that the space  
45 could be needed. The substation would be gas insulated and require 3 to 10 acres of land. In addition,  
46 equipment at Capistrano Substation found to be inadequate would be replaced.  
47

1 **3.2.9 Alternative E – New 230-kV Talega–Capistrano Line Operated at 138 kV<sup>1</sup>**

2  
3 Under this alternative, which was identified by the CPUC, the proposed double-circuit 230-kV line  
4 would be constructed between Talega Substation and the San Juan Hills High School and Rancho San  
5 Juan residential development area (Figure 3-4). The two new circuits would be operated at 138 kV rather  
6 than 230 kV. The new double-circuit transmission line would connect to two existing transmission line  
7 segments between Capistrano Substation and the San Juan Hills High School and Rancho San Juan  
8 residential development area.

9  
10 One of the existing 138-kV lines is the Laguna Niguel–San Mateo–Talega 138-kV Line (TL13835), and  
11 the second 138-kV line is currently operated at 12 kV (distribution circuit 315). Distribution circuit 315  
12 would be relocated as proposed, and the existing 138-kV circuit would be energized at 138 kV. If  
13 reconductoring is required between Capistrano Substation and the San Juan Hills High School and  
14 Rancho San Juan residential development area to upgrade sections of circuit 315, higher-capacity  
15 conductor (e.g., ACSS) similar in size to the existing conductor would be installed. The new Talega–  
16 Capistrano 138-kV Lines that would be created under this alternative could have a capacity of  
17 approximately 270 MVA, depending on whether reconductoring is required and the type of conductor  
18 installed.

19  
20 If it is not feasible to make use of circuit 315 under this alternative, only one 230-kV circuit (operated at  
21 138-kV) would be installed between Talega Substation and the San Juan Hills High School and Rancho  
22 San Juan residential development area on the new double-circuit poles. Circuit 315 would not be  
23 relocated and the Laguna Niguel–San Mateo–Talega 138-kV Line (TL13835) section between  
24 Capistrano Substation and the San Juan Hills High School and Rancho San Juan residential development  
25 area would be reconducted with higher-capacity conductor (see also Alternative B1).

26  
27 Equipment at Capistrano Substation would be replaced to the extent that the applicant can provide data  
28 indicating such replacement would be required to accommodate this alternative or would otherwise be  
29 required because the equipment is inadequate. If future load forecast and power flow studies indicate that  
30 the existing 138/12-kV Capistrano Substation must be expanded to a larger 230/138/12-kV substation as  
31 described for the proposed project, 4.8 miles of the proposed double-circuit 230-kV line (7.8 miles long)  
32 would already be in place to support this expansion.

33  
34 **3.2.10 Alternative F – 230-kV Rancho Mission Viejo Substation**

35  
36 This alternative was identified by the CPUC based on comments received during the EIR scoping  
37 meeting held in the city of San Juan Capistrano. In addition, details regarding the Eastern Talega 230-kV  
38 Transmission Line Route alternative, as described in the applicant’s PEA, are incorporated into this  
39 alternative. Under this alternative, the applicant’s 138/12-kV Rancho Mission Viejo Substation (Figure  
40 3-4) would be expanded to a 230/138/12-kV substation with specifications comparable to those of the  
41 proposed project’s new San Juan Capistrano Substation. Capistrano Substation would not be expanded,  
42 but equipment at Capistrano Substation found to be inadequate would be replaced.

43  
44 To bring a new 230-kV source into the South Orange County service area, a new, double-circuit 230-kV  
45 Talega–Rancho Mission Viejo line would be constructed along the Eastern Talega 230-kV Transmission  
46 Line Route described in the PEA. This route follows the existing Talega–Rancho Mission Viejo 138-kV  
47 Line (TL13831). Although two new 230-kV circuits would be installed, one of the circuits would be  
48 energized at 138 kV and operated as TL13831. The existing TL13831 structures and conductor would be  
49 removed, and the existing ROW (100 feet wide) would be increased by approximately 20 feet.



**Alternative E**

(New 230-kV Talega–Capistrano Line Segments Operated at 138 kV)



**Alternative F**

(230-kV Rancho Mission Viejo Substation)



**Alternative G**

(New 138-kV San Luis Rey–San Mateo Line and San Luis Rey Substation Expansion)

**LEGEND**

- |  |  |  |   |
|--|--|--|---|
|  | Proposed 230-kV substation upgrade                       |  | Existing 138-kV line                                    |
|  | Replace inadequate equipment at substation               |  | New double-circuit 230-kV line                          |
|  | Rebuild and expand substation without increase to 230 kV |  | New or reconducted 138-kV line in existing right-of-way |
|  | Existing 230-kV substation                               |  | Relocate 12-kV distribution line as proposed            |
|  | Existing 138-kV substation                               |  |   |

Figure 3-4 **New 138-kV Transmission Line and Rancho Mission Viejo Alternatives (Alternatives E, F, and G)**  
South Orange County Reliability Enhancement Project

1  
2 **3.2.10.1 Work Planned at Rancho Mission Viejo Substation**  
3

4 The applicant plans to replace 81 138-kV wood poles with steel poles between Talega Substation and  
5 Rancho Mission Viejo Substation along the Eastern Talega Transmission Line Route described under  
6 Alternative F (138-kV line TL13831). The replacement would be completed in 2016. The applicant  
7 anticipates that the conductor with a greater electrical carrying capacity would be installed on the new  
8 steel structures if approved by the CPUC (SCE 2012). The applicant also plans to construct three new 12-  
9 kV distribution lines from Rancho Mission Viejo Substation and replace approximately ten 138-kV wood  
10 poles with steel poles between Rancho Mission Viejo and Margarita substations (TL13838).  
11

12 **3.2.11 Alternative G – New 138-kV San Luis Rey–San Mateo Line and San Luis**  
13 **Rey Substation Expansion**  
14

15 This alternative was identified by the applicant in the PEA. Under this alternative, a new, approximately  
16 18-mile-long 138-kV transmission line would be constructed within existing and new ROW from San  
17 Luis Rey Substation to San Mateo Substation (Figure 3-4). Two new 230/138-kV transformers would be  
18 installed at San Luis Rey Substation, the substation would be expanded, and three 230-kV line segments  
19 would be modified. Capistrano Substation’s 138-kV and 12-kV facilities would be rebuilt as described  
20 for the proposed project, and a number of 138-kV transmission lines would be reconducted. In  
21 addition, a segment of the Laguna Niguel–Talega 138-kV Line (TL13835) from Capistrano Substation to  
22 Talega Substation would be modified to support a second 138-kV line, which would require a similar  
23 amount of construction as the double-circuit 230-kV transmission line that would be constructed as part  
24 of the proposed project.  
25

26 **3.2.12 Alternative J – SCE 230-kV Loop In to Trabuco Substation**  
27

28 This alternative was identified by the public during the Draft EIR public comment period. Under this  
29 alternative, the applicant would expand its existing 138/12-kV Trabuco Substation in Laguna Niguel into  
30 a 230/138/12-kV substation. The applicant would construct a 230-kV switchyard, including two, parallel  
31 230-kV/138-kV transformers (~~one required and spare~~), each with a capacity of 392 MVA. The applicant  
32 would acquire approximately 2 acres of land, currently owned by AT&T, adjacent to the north side of the  
33 existing Trabuco Substation for the construction and operation of the 230-kV switchyard. The 230-  
34 kV/138-kV transformers would be housed in a 40- to 50-foot high gas insulated substation building open  
35 air insulated. An approximately 3200 square foot, 20-foot high control building would be constructed on  
36 the expanded lot.  
37

38 A new underground, double-circuit 230-kV transmission line segment (approximately 0.5 miles long)  
39 would be constructed within new ROW that would loop the new substation into SCE’s Santiago–SONGS  
40 230-kV line. The new 230-kV transmission loop-in line would either exit the Trabuco Substation to the  
41 north in a new underground conduit along Camino Capistrano to connect to the Santiago–SONGS 230-  
42 kV line or exit the Trabuco Substation to the east overhead across Interstate 5, then into a new  
43 underground conduit along La Alameda, Los Altos, and Plaza and Bellogente roads to connect to the  
44 Santiago–SONGS 230-kV line (see Figure 3-5). The Santiago–SONGS 230-kV line would then become  
45 two new transmission lines: the Trabuco–SONGS 230-kV transmission line and the Trabuco–Santiago  
46 230-kV transmission line.  
47

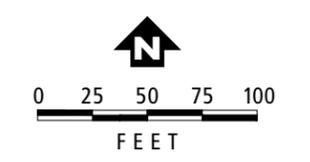
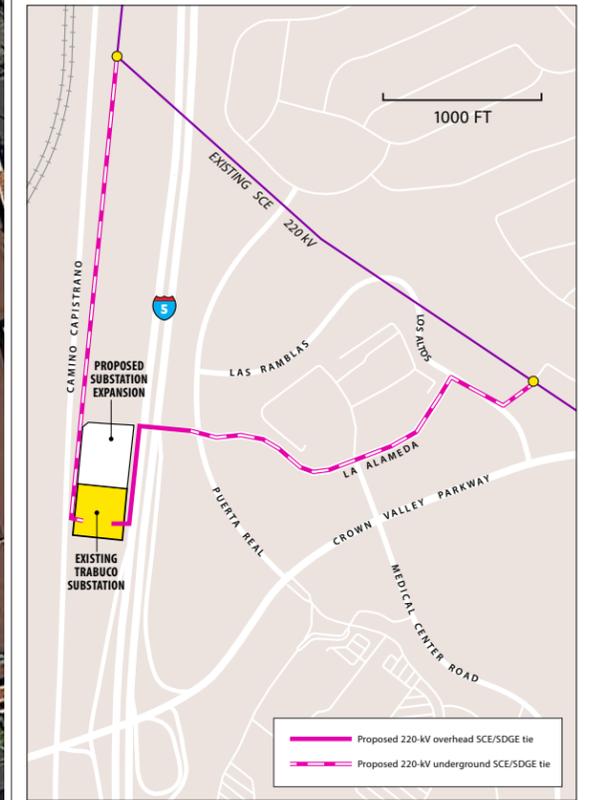
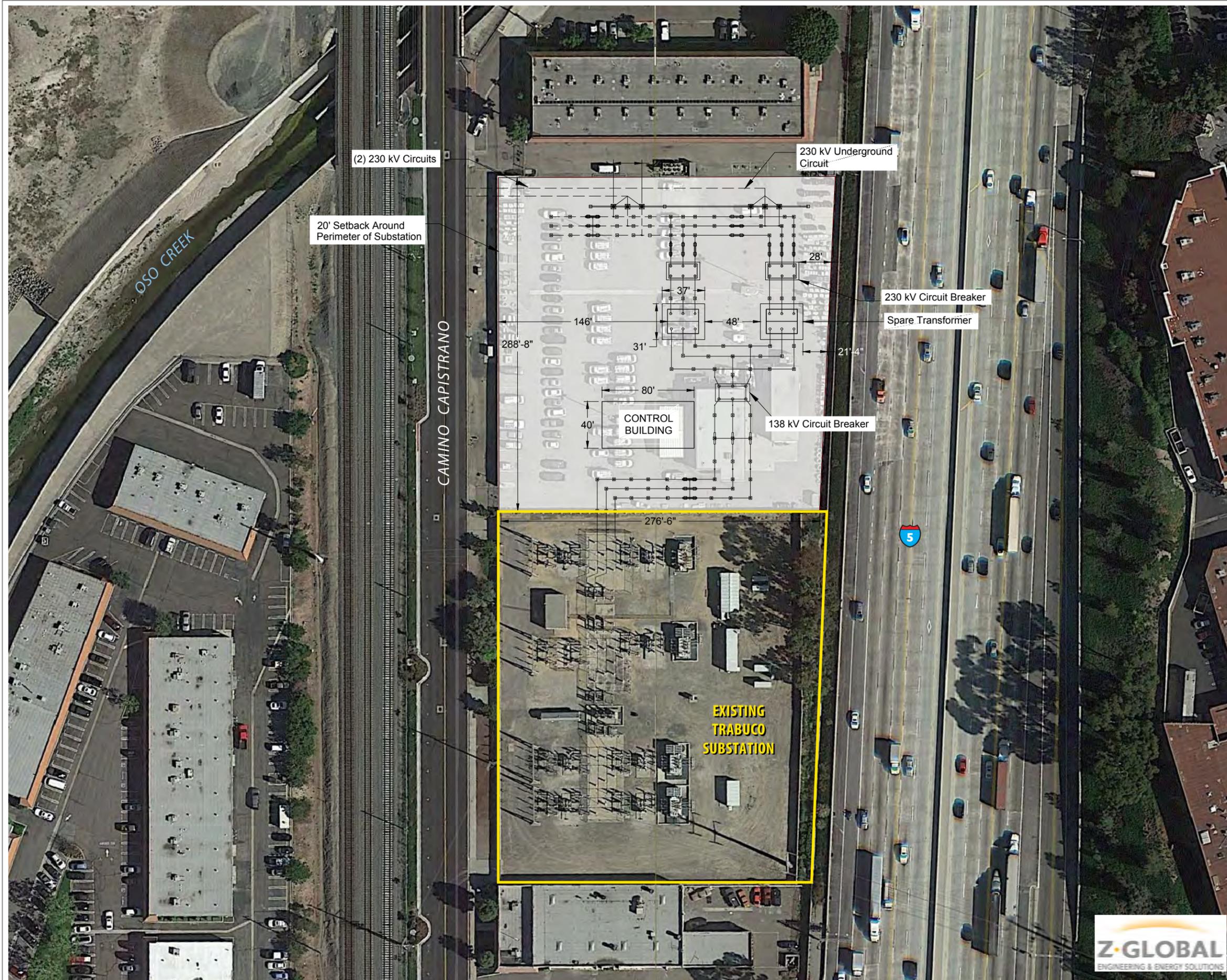


Figure 3-5  
**Trabuco Substation Conceptual Site Plan**  
 South Orange County Reliability Enhancement Project

1  
2 Major modifications to the existing Trabuco Substation would not be required as part of this alternative  
3 because the existing 138/12-kV equipment has not been identified as aging equipment by the applicant. It  
4 is anticipated that the Trabuco 130/12-kV system would remain operational while the new 230/138kV  
5 equipment is installed. Any potential disruptions of service would be limited to the time required to  
6 establish a physical connection between the new 230/138-kV equipment and the existing 138-kV  
7 equipment.

8  
9 Upgrades at Capistrano Substation would not be expanded required as part of this alternative, but  
10 equipment at Capistrano Substation found to be inadequate would be replaced. The distribution circuit  
11 315 (12-kV) would not be relocated. This alternative would not require any work at the existing  
12 Capistrano or Talega Substations. No 12-kV distribution lines or 138-kV transmission lines would  
13 require relocation or reconductoring.

14  
15 In AT&T's comment letter on the Recirculated Draft EIR, AT&T identified the 2 acres of land that  
16 would be acquired by SDG&E under this alternative as the maintenance yard for their Laguna Niguel  
17 Field Operations Center ("Laguna Niguel Center"). AT&T states that the Laguna Niguel Center cannot  
18 "function without the maintenance yard." (Hovey 2015) It is assumed that the Laguna Niguel Center  
19 would have to relocate under Alternative J. However, the extent and the details of the relocated Laguna  
20 Niguel Center are unknown at this time; therefore, the environmental impacts associated with the  
21 relocation of the Laguna Niguel Center are speculative. Pursuant to Section 15145 of the CEQA  
22 Guidelines, the environmental impacts associated with the relocation of the Laguna Niguel Center are not  
23 evaluated in this EIR.

## 24 25 **Consideration of CEQA Requirements for the Evaluation of Alternatives**

### 26 ***Project Objectives***

27 This alternative would meet each of the project objectives as defined in Section 1.32.1. The CPUC's  
28 review of the applicant's power flow data indicates that Alternative J would ensure that each of the  
29 potential Category C (N-1-1) contingencies identified by the applicant and CAISO (Section 1.2.1) would  
30 be avoided through the 10-year planning horizon (Objective 1). Equipment at Capistrano Substation  
31 found to be inadequate would be replaced (Objective 2), and power flow within the applicant's South  
32 Orange County 138-kV system would be redistributed (Objective 3).

### 33 34 ***Feasibility***

35 This alternative is potentially feasible from a technological, legal, and economic perspective.

### 36 37 ***Environmental Advantages***

38 Under this alternative, the applicant's 138/12-kV Trabuco Substation would be expanded to a  
39 230/138/12-kV substation with specifications comparable to those of the proposed project's new San  
40 Juan Capistrano Substation. The substation expansion would use an existing 2-acre AT&T parking lot  
41 located adjacent to the north side of the existing Trabuco Substation to house the new 230/138kV  
42 equipment. Capistrano Substation would not be expanded, but equipment at Capistrano Substation found  
43 to be inadequate would be replaced. The distribution circuit 315 (12-kV) would not be relocated. A new  
44 230-kV line would not be installed, nor would the San Juan Capistrano substation be constructed. The  
45 SDG&E South Orange County 138-kV System would not require any reconductoring under this  
46 alternative.

1 ~~Impacts to aesthetics and cultural resources at the Capistrano Substation site would not occur under this~~  
2 ~~alternative. Significant impacts on a cultural resource would be avoided under this alternative.~~ Potentially  
3 significant impacts on aesthetics, biological resources, air quality, traffic and transportation, cultural  
4 resources, and land use would be avoided or reduced. Impacts on all other resource areas would also be  
5 reduced, in large part because the size of the project area and total area of construction disturbance would  
6 be reduced.

7  
8 ***Environmental Disadvantages***

9 No environmental disadvantages are associated with this alternative in comparison to the proposed  
10 project are anticipated.

11  
12 **Conclusion**

13 **RETAINED.** Alternative J is potentially feasible, would meet all of the basic project objectives, and  
14 would reduce each of the potentially significant effects of the proposed project. Therefore, this  
15 alternative is retained for further consideration in the EIR. In addition, this alternative would add a  
16 second source of 230-kV power into the South Orange County 138-kV System, allowing for increased  
17 flexibility to dispatch power.

*This page intentionally left blank.*